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LXXIII. *On the Effects of anointing the Stems and Branches of Fruit Trees with Oil, and on the means of destroying Insects.* By Sir G. S. MACKENZIE, Bart. *

THE trees in my garden having been much infested with insects in the year 1815, I became anxious to devise means to prevent their increase. I recollected to have seen an apple tree in the Duke of Buccleuch's garden at Dalkeith, which had been almost destroyed by what is called the *scaly insect* †; but which had recovered on the application of a mixture of oil, sulphur, and soot. It is well known, that oil is fatal to insects, and to this part of the mixture I attributed the recovery of the tree. I conceived that oil, applied to the stems and branches of trees, might act in two ways; it might destroy the eggs and pupæ of insects already deposited; and it might prevent the attack of insects in future. It occurred to me also, that oil, by softening hard and diseased portions of the bark, might be in these respects beneficial to the health and growth of the tree, and enable the vegetative power to throw off such portions by a natural process, which might be preferable to the more violent proceedings of scraping, while the bark is constricted.

With these views, I directed my gardener to anoint a considerable number of trees of different kinds. Not being aware of any injury which was likely to arise from allowing the oil to touch the buds, he zealously rubbed every recess into which it was possible for eggs to be deposited; and this has been the means of my discovering, more extensively than I should otherwise have done, the effects of oil, both in regard to benefit and injury; though those of the last kind have put me to some little inconvenience. I shall now detail these effects.

Apple-trees.—In every case where the buds were not touched, every beneficial effect has followed the application of oil to the stems and branches. Fruit-buds, if touched, are destroyed; and also, if far advanced, the leaf-buds. But new buds of both kinds are afterwards produced in great numbers; and I remarked on two young trees with long bare stems, that buds burst forth on the stems, where none had appeared before. This is easily accounted for. The sap not being able to find the usual outlet in the expansion of the buds formed the previous year, acted so as to produce new buds and branches, in the same

* From the Transactions of the Caledonian Horticultural Society.

† The *scale* has, I understand, been lately discovered to be the nidus, in which the eggs of some winged insects are deposited. Larvæ have been observed to issue from it, but they have not yet been found in the pupa state.

manner as it does when a tree is cut over. There are now numerous fruit-buds on trees which had but few, and those few were completely destroyed.

Pear-trees.—These, though the more advanced fruit-buds suffered, have been less injuriously affected than apple-trees. Their growth has been unusually vigorous; and great numbers of new buds have been formed, covering branches which before were naked. This I remarked particularly on a jargonelle.

Plum-trees did not appear to suffer in any respect, but shot out blossoms and wood vigorously.

Peach-trees.—One tree, an old one, appeared to have been totally destroyed. But on examining it carefully, I observed some buds which appeared alive. I cut all the branches down to these buds, which have produced astonishingly fine shoots. A young tree, which for a year or two had made so little progress, and appeared so unhealthy, that it had been condemned, has shot forth in a surprising manner, and has become a very handsome tree. I was not, at first, particular in my examination of this tree, as, from its former appearance, I was not anxious about it. It is probable, however, that the oil had not reached the best buds.

Apricot-trees were so much injured, that the shoots were feeble, and the trees ultimately perished. I do not yet know what the effect will be when the buds shall be carefully avoided when the oil is applied.

Cherry-trees were seriously injured. When I speak of injury, I mean, that in those cases where the buds were not spared, new ones did not push forth, and the general health and vigour of the tree seemed impaired.

Vines, treated in this manner, without sparing the buds, die down to the root, from which strong-shoots are afterwards sent up. When the buds are not touched, they grow vigorously. But, on the whole, as the annual exfoliation of the bark admits of its being easily removed, I am not inclined to advise the application of oil to vines.

Gooseberry and *Currant-bushes* did not appear to derive any benefit, but seemed to me rather injured by the oil.

Those peach-trees which were not oiled, were as usual infested with aphides, while no insect of any kind was to be seen on those which had been oiled.

The apple aphis (*A. lanigera*) has been entirely extirpated from one garden, by means of oil applied to every part where it appeared; and I doubt not of its being soon destroyed in every district of the kingdom which it has reached, if the same means be used.

While the experiments leading to the results now detailed
were

were in progress, I was informed, that a Lady, who is fond of horticulture, had cured several trees of canker, by first removing the diseased parts, and then covering the wound with a piece of rag spread with hog's lard. We may infer, that oil will have the same effect.

I noticed very early in the progress of my experiments, that on the stems and branches which had been oiled, parts diseased, and where branches had been removed, became of a different hue from the rest of the bark; an exfoliation appeared to commence; and in autumn, new bark was seen to have been produced, and to have displaced that which was dead and diseased, so that it could be easily removed.

From what has been related, I am satisfied, that in many cases, trees will derive much benefit from the application of oil, care being taken not to touch the buds, especially if they have begun to swell.

Besides the enemies to fruit, which lurk in the bark, we have yet to contend with those which deposit their eggs on the leaves and blossoms. From wall and espalier-trees, the larvæ may be removed with little trouble; but when an attempt is made to clear standards, the trouble and time required cannot be expected to be repaid. Gardeners are in the habit of suspending on wall-trees, bottles with a little sugar, or honey, and water, to destroy the insects which attack ripening fruit. If they will hang up the bottles early in spring, both on wall-trees and standards, and continue to use them during the whole season, they will be surprised at the destruction of insect enemies which will ensue. Thousands of insects, some in search of food, and most of them pregnant, and some moving about for the purpose of depositing their eggs, will be tempted to their destruction; and few, comparatively, will be left to do mischief in the autumn. The bottles I have used for this purpose, are narrow in the neck, and depressed a little under the shoulders.

There is an enemy, however, which does more mischief than perhaps all the others put together, that cannot be destroyed by these means. As this enemy commits its depredations only during the night, it is not probably generally known. Pear-trees and vines seem to be most liable to the attacks of this lurking enemy; but it has been detected on many other kinds of trees. The destruction so often observed on grafts, is the result of this creature being permitted to multiply. It is, I believe, the *Curculio vastator*, a weevil, which retires during the day amongst little clods of earth, from which, owing to its colour, it is scarcely distinguishable, as it never moves when touched. When mischief is observed to have been done, and the enemy is not perceived, by looking amongst the earth at the foot of the tree,

these weevils will be found. They can only be destroyed by searching for them, and killing each individual when discovered. The method which I have found the simplest and the most effectual, is to tread the earth round the stem after it is dark, and to place bits of slates, tiles, or small stones round it. In the morning, the weevils retreat under them, and may be picked up. Craeks in the bark, the separations of branches, holes in the wall, and every cranny into which it is possible for the weevils to enter, should be examined. Perhaps wrapping round the stem, a little tow soaked with some adhesive composition, such as the basilicon ointment of apothecaries, may have the effect of arresting these insects, when they attempt to ascend the stems of the trees.

The *Curculio abietis* was detected once on a vine. This is a considerably larger weevil than the *vastator*, and is one of those with a lengthened snout. If gardeners will take the trouble, occasionally, to look over their trees and bushes in the night-time, many nocturnal depredators, and their haunts, may be discovered, which are at present little suspected. It would be of importance, when any new enemy is discovered, that it should be sent to you, with an account of the manner in which it inflicts injury, of the particular parts of the plant which it attacks, and of such other circumstances as may be known concerning it.

A member of this Society, Mr. John Linning, has informed me, that he has found a little oil put on the stems of carnations, very effectual in protecting them from the attacks of earwigs.

As this defence is always at hand, and may be easily made use of, horticulturists and florists will, I hope, repeat and extend the experiments which have been made.

The oil which I used was common fish-oil. Whale-oil of the coarsest kind will answer equally well; and indeed any greasy substance. No more should be put on than will just produce a shining surface.

LXXIV. Notices respecting New Books.

Philosophical Transactions of the Royal Society of London, for 1819. Parts II. and III.,

THE following are the titles of the papers contained in these additional Parts of the Transactions of the Royal Society for the present year:—On the Specific Gravity and Temperature of Sea Waters in different Parts of the Ocean and in particular Seas, with some Account of their Saline Contents. By Alex. Marcet, M.D.—An Account of the Fossil Skeleton of the *Proterog Saurus*.

By